MONTANA DEPARTMENT OF FISH, WILDLIFE & PARKS

PROCEDURE FOR CLASSIFYING MONTANA STREAMS

SPRING 1980

G E N E R A L

Six value classes were established:

Value Class	Class Definition
1	Highest-value fishery resource
2	High priority fishery resource
3	Substantial fishery resource
4	Moderate fishery resource
5	Limited fishery resource
6	Not yet classified

Each stream reach was placed in a value class for each of the two criteria below. The final classification, the fishery resource value, was the higher class given for criterion 1 or 2. In accomplishing this, data for each stream reach were entered in a computer file and a computer program used to check the attributes and assign the class for each reach.

Criterion 1 - Habitat and Species Value of Stream Reach

The class of each reach was determined by a point system in which most points were awarded for important habitats of fishes of special concern (native fishes found in limited numbers and/or limited waters). Fewer points were awarded to less important habitats of fishes of special concern and for the occurrence of widespread species found in substantial numbers. Least points were awarded for occurrence of non-indigenous species considered of minimal value. Additional consideration was given streams that are important sources of trout recruitment. Points were also given for spring streams; esthetics (natural beauty); and for local community value where a stream, being one of few or the only one in the immediate area, is important to a community for scientific study, nature study, and/or recreation.

Criterion 2 - Sport Fishery Potential of Stream Reach

The class of each reach was based on a point system in which points were awarded for (1) fish abundance as indicated by biomass or numbers and sizes of game or sport fish, (2) ingress (legal rights of the public to fish the reach or willingness of landowner to permit fishing), (3) esthetics and (4) use by fishermen (fishing pressure).

A listing naming each stream reach, describing its upper and lower boundaries, and giving its classification is available, as is a detailed account of how each reach met the requirements of its class.

DETAILED PROCEDURE FOR ASSIGNING VALUE CLASSES

A. Procedure for Criterion 1 Habitat and Species Value of Stream Reach

I. Standards and Associated Points

Points [1]	Standard	
15	1	Highest-valued habitat [2] for a class A fish of special concern [3].
10	II	High priority habitat for a class A fish of special concern OR Highest-valued habitat for a class B fish of special concern.
5	III	Substantial habitat for a class A fish of special concern. OR High priority habitat for a class B fish of special concern. OR Highest-valued habitat for a class C fish of special concern.
3	IVA	Substantial habitat for a class B fish of special concern. OR High priority habitat for a class C fish of special concern.
1.5	IVB	Substantial habitat for a class C fish of special concern.
.4	V	Limited habitat for any fish of special concern. OR Abundant [4] population of: (1) native not fish of special concern [5] or (2) non-native game or sport species [5].
.3	VIA	Common abundance of: (1) native not fish of special concern OR (2) non-native game or sport species.
.2	VIB	Same as VIA only abundance rating is uncommon or unknown.
.1	VII	Same as VIA only abundance is rated as rare, M (species absent might be present if habitat problem corrected) or E (species expected but not verified). OR Presence of any non-native non-sport species.
3	VIII	Esthetics rating is C or higher on a scale of A highest to E lowest [6].
3	IX	Stream is one of few streams or only one in the immediate area and is important to community for scientific study, nature study and/or recreation.
3	X	Stream is a spring stream or spring creek.

1/ Points are awarded for each species meeting a standard.
2/ Habitat designations: highest-valued, high priority, substantial and limited are based on judgment decisions of fisheries biologists.
3/ See list of fishes of special concern in Appendix.
4/ See "Fish Abundance Ratings" in Appendix.
5/ See list of Montana fish species in Appendix.
6/ See explanations of esthetics ratings in Appendix.

II. Assignment of class

Points	Habitat and Species Value Class
15 or more	1
10 to less than 15	2
5 to less than 10	3
.3 to less than 5	4
Greater than zero to less than .3	5
0	6

Important streams for trout recruitment, including passage, are advanced one class but not higher than class 3.

NOTE: Unless fish are known to be present the stream reach is automatically in class 6.

B. Procedure for Criterion 2 - Sport Fishery Potential of Stream Reach

Component I. Fish Abundance - Award of Points and Assignment of Grade

a. Points for abundance of all trout species combined [1/]

Biomass (Kg) per 300 m	Points
70 and over	9
12 to less than 70	6.5
5 to less than 12	4
3.5 to less than 5	2
Greater than 0 to less than 3.5	1

If trout present but biomass unknown:
Each species with abundance A,B,C or D [2/] is assigned 1 point
Each species with abundance U,V or Z is assigned .5 points

b. Points for abundance, class A non-trout game and sport fish for streams. [1/]

Abundance Rating [2/]	Points
A	2
B	3
C	1
D	2
U, V and Z	.5

NOTE: Maximum for mountain whitefish is 2 points.

c. Assignment of abundance grade

Points (sum of points from a and b above)	Grade
9 and over	4
6 to less than 9	3
3 to less than 6	2
Greater than 1 to less than 3	1
1 or less	0

Component II. Assignment of ingress grade

Ingress rating [2/]	Grade
1	4
2	3
3	3
4	2
5	1
6 and 7	0

1/ For species designations see list of Montana fishes in Appendix.
2/ See explanation or ratings in Appendix.

Component III. Assignment of Esthetics Grade

Esthetics rating [1]	Grade
A	4
B	3
C	2
D	1
E	0

Component IV. Assignment of Use (Fishing Pressure) Grade

Fisherman-days/10 km	Grade
1250 and over	4
310 to less than 1250	3
65 to less than 310	2
Greater than 0 to less than 65	1
0 (none or unknown)	0

Computation of Sport Fishery Potential Score and Assignment of Class.

A. Score = Sum of (grade for each component x multiplier [2]).

B. Assignment of Class

	Score	Conditions	Sport Fishery potential class
1.	17 and over	Fish production based on natural reproduction. Trout with abundance B or D (large-sized) [3] or paddlefish must be present. and ingress rating of 1, 2 or 3 and esthetics rating of A, B or C and overall use of 5000 or more [4]	1
2.	17 and over	Ingress rating of 1, 2 or 3 and at least one condition in 1 above not met.	2
3.	17 and 18	Ingress rating of 4 to 7	3
4.	15 to less than 17	Ingress rating of 1,2 or 3	2
5.	15 to less than 17	Ingress rating of 4 to 7	3
6.	Greater than 11 to less than 15		3
7.	Greater than 4 to 11		4
8.	Greater than 0 to 4		5
9.	0		6

Note: If no fish are present stream reach is automatically in class 6.

1/ See explanation of ratings in Appendix.
2/ Multiplier for fish abundance is 2; for other components (ingress, esthetic and use) the multiplier is 1.
3/ See explanation of abundance ratings in Appendix.
4/ For the purpose of meeting the 5000 fisherman days (FMD) requirement, the stream segment may be a composite of adjoining reaches that meet all other conditions for class 1, provided each reach with less than 5000 FMD's is less than 6 km. long.

C. Assignment of Fishery Resource Value Class

The fishery resource value class is simply the higher class given for criterion 1 or 2 above.

APPENDIX

INGRESS RATING. As used here, ingress means the legal right to enter.

Code

1 - Stream section bordered almost entirely by public lands which insure ingress by anglers (exclude state school sections).

2 - A stream section bordered by a mix of private and public land where the public land is distributed in such a way that no significant portion of the stream is unavailable by vehicle and/or walking. Floating may also be a major means of access.

3 - A stream section bordered by mostly private land where ingress in uncontrolled or readily available by permission. This portion may be available by floating or through navigability laws. Also includes corporate lands - these are currently open but could go to individual ownership in the future or company policy regarding ingress could change.

4 - A stream section bordered mostly by private land where ingress is limited but some fishing is allowed. May include minor portions where public land or road crossing may provide limited ingress. The portion through private land may be available by floating or through navigability laws.

5 - A stream section bordered entirely by private land where public fishing is available for a fee or where a small group has leased exclusive rights. Legality may be in question on some streams but this category identifies the current "fee" or "lease" fishing areas.

6 - A stream section bordered mostly by private land where little or no ingress by permission is allowed. Floating precluded by stream size or other physical limitation (no road or public land to reach stream).

7 - A stream or stream segment bordered by public land that is unavailable because of posting on private land or locked gates on private roads.

FISH ABUNDANCE RATINGS. Abundance of fish refers only to adult fish, or in case game and sport fish to keeper size (7" minimum for trout; exception 6" minimum for trout populations which spawn when shorter than 7"). By nature abundance ratings are subjective. Since trout command the most interest of Montana fishes, the abundance ratings for all fishes were geared to trout. The abundance graph (Figure 1) is a guide to numbers associated with abundant, common, uncommon and rare. The ratings reflect the peak abundance during the year, e.g., when migratory spawners are present.

A = Abundant
B = Abundant with proportional number of large-sized fish (see appendix)
C = Common
D = Common with proportional number of large-sized fish (see appendix)
U = Uncommon
V = Uncommon with proportional number of large-sized fish (see appendix)
R = Rare
E = Presence not verified but expected
M = Species absent but could be present if habitat problems corrected
N = Not present
P = Species absent, but might be present if introduced
(e.g. potential habitat in a barren stream)
Z = Abundance unknown

Special codes entered in abundance column to indicate habitat value of reach for species of special concern.

G = Highest-valued

H = High priority

S = Substantial value

L = Limited value

CODES FOR FISHES' USE OF REACH

Codes indicating single use or dominant use:

L = Resident throughout life cycle

A = Spawning elsewhere (includes hatchery fish) -- spends part or most of life in reach

H = Spawning and hatching -- young promptly move downstream

J = Spawning and nursery to subadult

C = Passing through -- species uses reach as a corridor to migrate upstream and return downstream

F = Feeding run

N = No use (in connection with abundance codes M, N and p)

Z = Use undetermined

Codes that are combinations of the above codes to indicate more than one population of a species.

R = L plus A, H or J

P = C plus L, A, H or J

S = H and J combined

Any other combination: Code entered for dominant use.

ESTHETICS RATINGS. Esthetics were rated A (high) through E (low). Features that detract from esthetics include: pollution, dewatering, channelization, riprap (particularly car bodies and discarded building materials), mine tailings, a busy highway along stream and severe land abuse. As a guide:

A - A water of outstanding natural beauty in a pristine setting.

B - A water comparable to A except that it may lack pristine characteristics. Presence of human development such as roads, farms, etc., usually comprise the difference between B and A.

C - A water with natural beauty but of a more common type than listed under A and B. A clean stream in an attractive setting.

D - A stream and area with fair esthetics.

E - A stream with low esthetics.

MONTANA FISHES OF SPECIAL CONCERN *

Class A--limited numbers and/or limited habitats both in Montana and elsewhere in North America; elimination from Montana would be a significant loss to the gene pool of the species or subspecies.

- White sturgeon (Acipenser transmontanus)
- Pallid sturgeon (Scaphirhynchus albus)
- Paddlefish (Polyodon spathula)
- Yellowstone cutthroat trout (Salmo clarki bouvieri)
- Arctic grayling (Thymallus arcticus)

Class B--intermediate between classes A and C. Limited numbers and/or limited habitats in Montana; fairly widespread and fair numbers in North America as a whole. Elimination from Montana would be at least a moderate loss to the gene pool of the species or subspecies.

- Westslope cutthroat trout (Salmo clarki lewisi)
  --includes upper Missouri cutthroat trout
- Native rainbow trout (Salmo gairdneri)
- Sturgeon chub (Hybopsis gelida)
- Sicklefin chub (Hybopsis meeki)
- Shorthead sculpin (Cottus confusus)

Class C--limited numbers and/or limited habitats in Montana; widespread and numerous in North America as a whole. Elimination from Montana would be only a minor loss to the gene pool of the species or subspecies.

- Shortnose gar (Lepisosteus platostomus)
- Finescale dace (Phoxinus neogaeus)
- Trout-perch (Percopsis omiscomaycus)
- Spoonhead sculpin (Cottus ricei)

STANDARDS FOR LARGE-SIZED FISH

Species	Kg	Lbs.	Species	Kg	Lbs.
Shovelnose sturgeon	2.7	6	Northern Pike	6.8	15
Paddlefish	34.0	75	Bullhead--		
Mountain whitefish	.9	2	black & yellow	.3	.7
Kokanee	.9	2	Channel catfish	3.6	8
Cutthroat trout	.7	1.5	Burbot	2.7	6
Rainbow trout	1.4	3	Smallmouth bass	.9	2
Brown trout	1.4	3	Largemouth bass	1.8	4
Brook trout	.5	1	Crappie--		
Dolly Varden	3.6	8	black & white	.5	1
Lake trout	6.8	15	Yellow perch	.5	1
Arctic Grayling	.9	2	Sauger	.9	2
Golden trout	.5	1	Walleye	1.8	4
Kokanee		2.5			

* See January/February 1980 Montana Outdoors for article on fishes of special concern.

MONTANA FISHES IN FAMILY SEQUENCE (Also see fishes of special concern list)

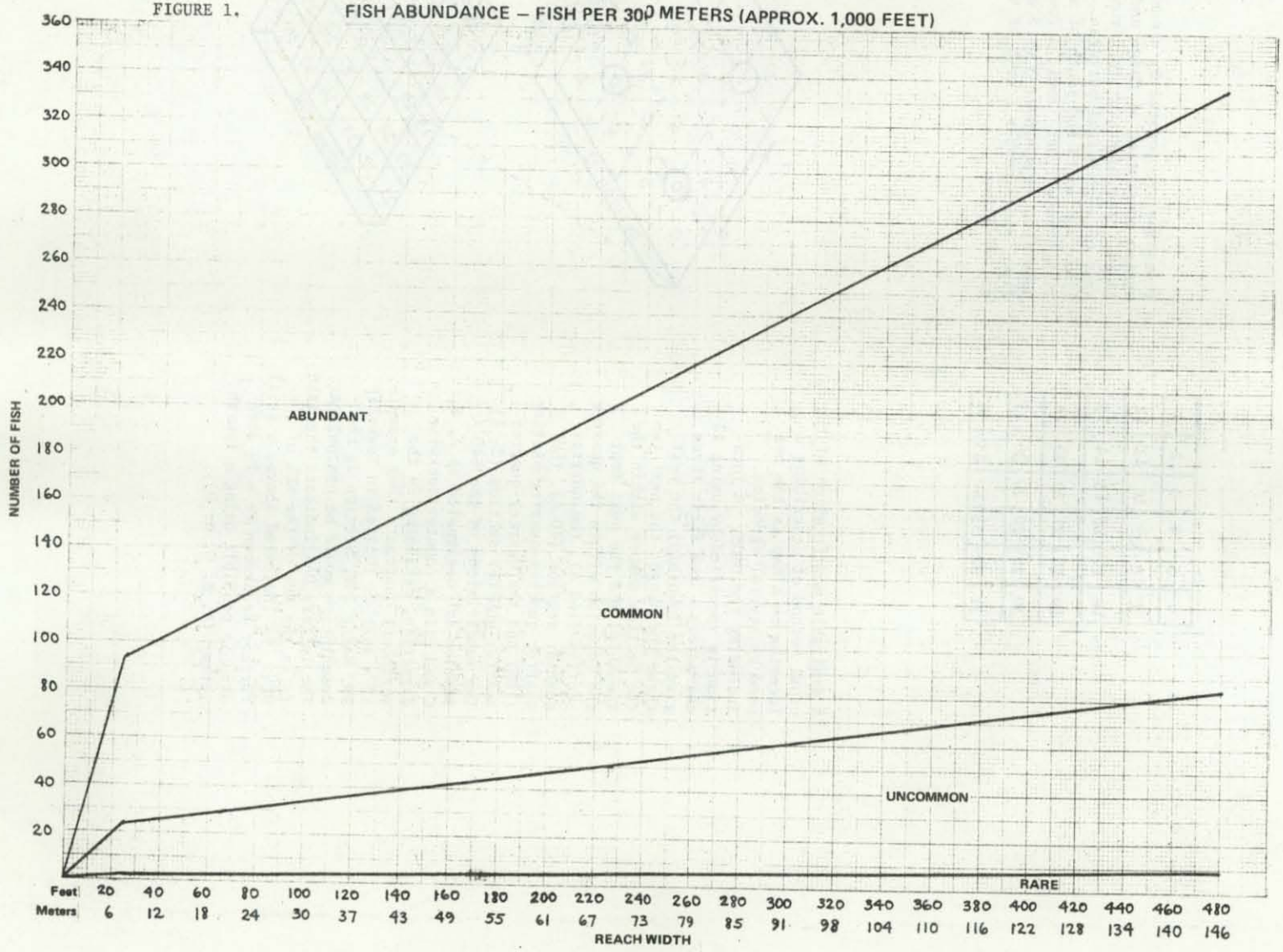
MT FW&P Code	
+ 27	- Sturgeon*
+ 90	- White sturgeon
+ 91	- Pallid sturgeon
+ 92	- Shovelnose sturgeon
+ 28	- Paddlefish
38	- Shortnose gar
34	- Goldeye
° 01	# Rainbow trout* (See 122)
° 02	- Cutthroat trout*
° 03	# Brook trout
° 04	# Brown trout
° 05	- Dolly Varden
° 06	- Lake trout
° 07	# Golden trout
+ 08	# Kokanee
09	# Coho salmon
+ 10	- Arctic grayling
° 11	# Rainbow x cutthroat trout hybrid
° 12	- Westslope cutthroat trout (pure)
° 13	- Yellowstone cutthroat trout (pure)
14	- Whitefish*
15	# Lake whitefish (May be native in St. Mary's Lake)
+ 85	- Mountain whitefish
86	- Pygmy whitefish
87	# Chinook salmon
88	# Splake
+ 89	# Salmon*
°118	Trout*
119	Trout/Salmon*
°120	# Rainbow trout x golden trout hybrid
°121	- Upper Missouri cutthroat trout (pure)
°122	- Native rainbow trout
99	# Rainbow smelt
23	# Northern pike (native only in (Saskatchewan River Drainage)
29	- Peamouth
30	. Goldfish
32	. Carp
33	- Northern squawfish
35	. Utah chub
37	- Minnow*
39	- Longnose dace
41	- Northern redbelly/Finescale dace*
42	- Brassy minnow
43	- Silvery/Plains minnow*
44	- Flathead chub
45	- Lake chub
46	- Sturgeon chub
47	- Emerald shiner
48	- Sand shiner
49	- Redside shiner
50	- Creek chub
51	- Pearl dace
52	- Fathead minnow
53	. Golden shiner (May be native in eastern Montana)
54	- Sicklefin chub

MT FW&P Code	
140	- Silvery minnow
141	- Plains minnow
142	- Finescale dace
143	- Northern redbelly dace
31	- Sucker*
40	- Buffalo
55	- River carpsucker
56	- Longnose sucker
57	- White sucker
58	- Largescale sucker
59	- Blue sucker
60	- Bigmouth buffalo
61	- Smallmouth buffalo
62	- Shorthead redhorse
63	- Mountain sucker
+24	- Channel catfish
25	# Bullhead*
64	- Stonecat
65	# Black bullhead
66	# Yellow bullhead
100	- Trout-perch
+26	- Burbot
103	- Plains killifish (Probably native)
106	. Mosquitofish
109	. Shortfin molly
112	. Variable platyfish
115	. Green swordtail
71	- Brook stickleback
72	# White bass
17	# Largemouth bass
18	# Bass*
19	# Sunfish*
21	# Crappie*
+73	# Smallmouth bass
74	# Bluegill
75	# Pumpkinseed
76	# Green sunfish
77	# Black crappie
78	# White crappie
79	# Rock bass
20	# Yellow perch
+22	. Sauger/Walleye*
+81	- Sauger
+82	# Walleye
83	- Iowa darter
36	- Freshwater drum
16	- Sculpin*
130	- Mottled sculpin
131	- Slimy sculpin
132	- Torrent sculpin
133	- Shorthead sculpin
134	- Spoonhead sculpin

Codes:

°	Trout species	-	Native fish, i.e. indigenous
#	Non-native game or sport fish	.	Non-native non-sport fish
+	Class A non-trout game or sport fish for streams	*	Undesignated as to species or strain

FIGURE 1.


FISH ABUNDANCE – FISH PER 300 METERS (APPROX. 1,000 FEET)
NUMBER OF FISH
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
ABUNDANT
COMMON
UNCOMMON
RARE
Feet 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480
Meters 6 12 18 24 30 37 43 49 55 61 67 73 79 85 91 98 104 110 116 122 128 134 140 146
REACH WIDTH

Land Description: Township - Range - Section - Subsection

Explanation of letters (A, B, C and D) designating subsections

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Townships are located by a numbered grid system consisting of Range and Township lines. The Township lines run east and west of a principal meridian. The Range lines run north and south of an established base line. Thus, a Township is described as a number N or S of the base line, and a number E or W of the principal meridian.

A desirable modification of the usual method of describing a location on a map is the one used by several agencies, including the USGS. A location is specified by using 12 characters - the first three give the Township; the next three the Range; the next two the Section number within the Township; and the next four the location within the quarter section (160 A), the quarter-quarter section (40 A), the quarter-quarter-quarter section (10A) and the quarter-quarter-quarter-quarter section (2½ A). The subdivisions of the 640 A section are designated as A, B, C and D in a counterclockwise direction, beginning in the northeast quadrant. For example, if a lake is located in Township 9N, Range 20W, Section 21 the description would be 09N20W21DAA. The letters DAA indicate the lake is in the NE¼ of the NE¼ of the SE¼. As indicated above, a still further breakdown to a 2½ acre area is possible using a fourth letter (A, B, C, or D).